

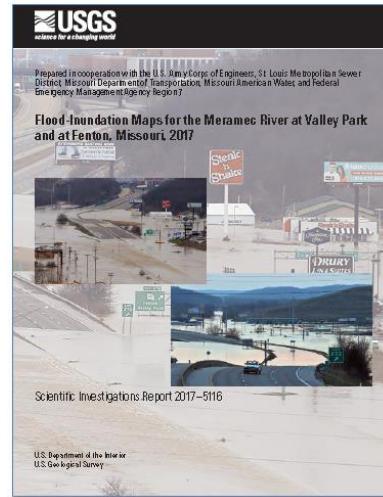
# Research Summary

## Flood Inundation Mapping for the Lower Meramec River

The Meramec River is the longest free-flowing river through east-central Missouri and has been a source of flood damage for many years. Despite the known hazards of flooding, U.S Army Corps of Engineers (USACE), Federal Emergency Management Agency (FEMA), City, and State Emergency management mitigation teams typically suffer from a lack of information related to the location, water depth, and water velocities of inundated areas both during and after floods. Industries and residents have to make quick and expensive decisions regarding evacuation of people and removal of equipment and property. Although the National Weather Service (NWS) issues peak stage forecasts at five cooperative U.S. Geological Survey (USGS) streamgages in the lower Meramec River, there is no data to indicate areas that may be inundated **between the streamgages**.

During late December 2015 and early January 2016, there was large scale flooding along a 50-mile reach of the Lower Meramec River from Pacific, Missouri downstream to the mouth at the Mississippi River. Along a seven-mile reach of the Meramec River, **from Valley Park, Missouri upstream to Fenton, Missouri downstream**, the flood impacted many commercial and residential communities in addition to area roads, including I-44.

The USGS Missouri Water Science Center (MOWSC) proposed the development of **online**



**flood inundation mapping (FIM) tools** for this selected reach of the lower Meramec River.

Flood profiles were computed for the stream reaches by means of a calibrated one-dimensional step-backwater hydraulic model already developed by the USACE. Two sets of digital flood inundation map libraries that spanned this combined 16.7-mile reach of the river were created by USGS in cooperation with the USACE, St. Louis Metropolitan Sewer District (MSD), **Missouri Department of Transportation (MoDOT)**, Missouri American Water (MAW), and FEMA Region 7 (FEMA MO).

The flood-inundation maps, which can be accessed through the [USGS Flood Inundation Mapping Program website](#), depict estimates of the area extent and depth of flooding corresponding to selected water levels (stages) from Valley Park, Missouri (USGS station #07019130) to Fenton, Missouri (USGS station #07019210). The project used existing high resolution topographic data supplemented with precise field surveys of critical points such as the low points of roads, levees, or the first-floor elevations of selected buildings.

After the project was concluded, a stakeholder meeting was held at the MoDOT St. Louis District Office in June 2017 to share the results



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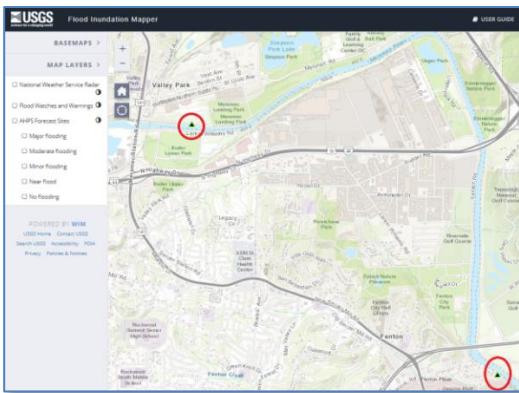
of the research and demonstrate the capabilities of the flood inundation mapping tool.

In conclusion, the availability of timely flood inundation maps, along with internet information regarding current stage from the USGS streamgages and forecasted high-flow stages from the NWS, will provide emergency management personnel and residents with information that is critical for flood response activities such as evacuations and road closures and for post flood recovery efforts.

For more information, see the [FIM Program Fact Sheet](#). In addition, a [FIM Toolbox](#) provides a set of criteria and guidance on how to develop a FIM in other parts of the country. There is also a more mobile friendly interface for the [FIM Mapper Tool](#) (Adobe Flash not required).



Meramec River flooding at I-44/Route 141



Screenshot of [USGS Flood Inundation Mapper](#) showing lower Meramec River streamgage locations

## Project Information

**PROJECT NAME:** Meramec River Flood Mapping

**PROJECT START/END DATE:** August 2016-December 2017

**PROJECT COST:** \$128,000 comprising \$30,000 each from MSD, USGS (cash), MoDOT; \$13,000 from FEMA MO; \$10,000 each from USGS (in-kind) and USACE, and \$5,000 from MAW

**LEAD CONTRACTOR:** U.S. Geological Survey

**PRINCIPAL INVESTIGATOR:** Paul Rydlund

**REPORT NAME:** U.S. Flood Inundation Maps for the Meramec River at Valley Park and at Fenton, Missouri, 2017

**REPORT NUMBER:** [USGS SIR 2017-5116](#)

**REPORT DATE:** September 2017

## Project Manager

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